

WE CLAIM:

1 1. In a data communications system, a method of interleaving data into a single
2 interface from a plurality of channels supporting a plurality of data rates, the method
3 comprising the steps of:

4 polling each channel in the data communications system to determine if the
5 channels are active, the polling order determined according to a state machine, the
6 state machine comprising at least one state for each data rate supported by the
7 plurality of channels; and

8 interleaving data from the active channels into the single interface according
9 the states of the state machine.

1 2. The method of claim 1 further comprising the step of changing the data rate of
2 at least one of the plurality of channels.

1 3. The method of claim 1 wherein the state machine further comprises at least four
2 states.

1 4. The method of claim 1 further comprising the step of buffering the data.

1 5. The method of claim 1 further comprising the step of enabling one or more
2 channels.

1 6. The method of claim 1 further comprising the step of disabling one or more
2 channels.

1 7. The method of claim 1 wherein the data channels comprise dissimilar physical
2 layers.

1 8. The method of claim 1 wherein the data communications network comprises a
2 synchronous optical network (SONET).

1 9. The method of claim 1 wherein the plurality of data rates comprise digital signal
2 level zero (DS0), digital signal level one (DS1), digital signal level two (DS2), and
3 digital signal level three (DS3).

1 10. For use in a data communications network, a reconfigurable transmit
2 mechanism supporting the interleaving of data from data channels having dissimilar
3 data rates, comprising:

4 sequential circuit means for polling each data channel to identify active data
5 channels; and

6 means for interleaving data from the active data channels into a single
7 interface for transmission in the data communications network.

1 11. The mechanism of claim 10 further comprising means for reconfiguring the data
2 channels for different data rates.

1 12. The mechanism of claim 10 further comprising means for buffering the data
2 prior to interleaving.

1 13. The mechanism of claim 10 wherein the data communications network further
2 comprises a SONET.

1 14. The mechanism of claim 10 further comprising means for enabling/disabling
2 channels.

1 15. A data communications routing circuit supporting the interleaving of data from
2 a plurality of data channels having dissimilar data rates, comprising means for:

3 (a) identifying one or more first active data channels from among a plurality
4 of channels of a first data rate;

5 (b) inviting the one or more first active channels to send data at a first data
6 rate;

7 (c) identifying one or more next active data channels from among a plurality
8 of channels of a next data rate; and

9 (d) inviting the one or more next active channels to send data at a next rate.

1 16. The routing circuit according to claim 15 further adapted for the reiteration of
2 steps (c) and (d) for at least three dissimilar data rates.

1 17. The routing circuit according to claim 15 further adapted for the reiteration of
2 steps (c) and (d) for five or more dissimilar data rates.

1 18. The routing circuit of claim 15 further comprising means for reconfiguring
2 channels for different data rates.

1 19. The routing circuit of claim 15 wherein the data communications network further
2 comprises a SONET.

1 20. The routing circuit of claim 15 further adapted for dynamically
2 activating/deactivating one or more channels.